REMARKS

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attachment is captioned "Version with markings to show changes made."

Applicant respectfully requests that a timely Notice of Allowance be issued in this case. However, should there remain unresolved issues that require action, it is respectfully requested that the Examiner telephone Richard A. Dunning, Jr., Applicant's Attorney, at 831.420.0561 so that such issues may be resolved as expeditiously as possible. Applicant submits that all of the claims are now in condition for allowance, which action is requested. Filed herewith is a payment for any excess claims fees required by the above amendments.

Date: 10/23/02

Law Office of Richard A. Dunning, Jr.
343 Soquel Avenue, Suite 311
Santa Cruz, CA 95062
Telephone: 831.420.0561
Facsimile: 413.541.0092

Respectfully submitted,

Richard A. Dunning, Jr.
Attorney/Agent for Applicant
Reg. No. 42502

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Paragraph 0099 has been replaced with the following paragraph. The only change to this paragraph is the addition of an asterisk (*) to the equation following the phrase "Compute the correlation function" (sse the third to last bullet point below).

[0099] Now the processing of the DTV channel signal by DSP 1014 is described for a coherent software receiver. A nominal offset frequency for the downconverted sampled signal is assumed. If this signal is downconverted to baseband, the nominal offset is 0Hz. The process generates the complete autocorrelation function based on samples of a signal $s(t)$. The process may be implemented far more efficiently for a low duty factor reference signal. Let T_i be the period of data sampled, ω_{in} be the nominal offset of the sampled incident signal, and let ω_{offset} be the largest possible offset frequency, due to Doppler shift and oscillator frequency drift. The process implements the pseudocode listed below.

- $R_{max} = 0$
- Create a complex code signal

$s_{code}(t) = C_i(t) + jC_q(t)$

where C_i is the function describing the in-phase baseband signal and C_q is the function describing the quadrature baseband signal.

- Compute $F(s_{code})^*$ where F is the Fourier transform operator, and * is the conjugate operator.
- For $\omega = \omega_{in} - \omega_{offset}$ to $\omega_{in} + \omega_{offset}$ step $\frac{\pi}{2T_i}$
    - Create a complex mixing signal
      $s_{mix}(t) = \cos(\omega t) + j\sin(\omega t),\ t = [0 \ldots T_i]$
    - Combine the incident signal $s(t)$ and the mixing signal $s_{mix}(t)$
      $s_{comb}(t) = s(t)s_{mix}(t)$

- Compute the correlation function $R(\tau) = F^{-1}\left\{F(s_{code})^{*}_{-} F(s_{comb})\right\}$
- If $\max_{\tau}|R(\tau)| > R_{\max}$, $R_{\max} \leftarrow \max_{\tau}|R(\tau)|, R_{store}(\tau) = R(\tau)$

- Next ω

Paragraph 0106 has been replaced with the following paragraph:

[0106] Implementations of the present invention exploit the low duty factor of the DTV reference signal in many ways. For example, one implementation employs a time-gated delay-lock loop (DLL) such as that disclosed in J. J. Spilker, Jr., Digital Communications by Satellite, Prentice-Hall, Englewood Cliffs NJ, 1977, Chapter 18-6. Other implementations employ variations of the DLL, including coherent, noncoherent, and quasi-coherent DLLs, such as those disclosed in J. J. Spilker, Jr., Digital Communications by Satellite, Prentice-Hall, Englewood Cliffs NJ, 1977, Chapter 18 and B. Parkinson and J. Spilker, Jr., Global Positioning System-Theory and Applications, AIAA, Washington, DC, 1996, Vol. 1, Chapter 17, Fundamentals of Signal Tracking Theory by J. Spilker, Jr. Other implementations employ various types of matched filters, such as a recirculating matched filter.